

Electro-Optic Laser Scanners for Space-Based Lidar, Phase I

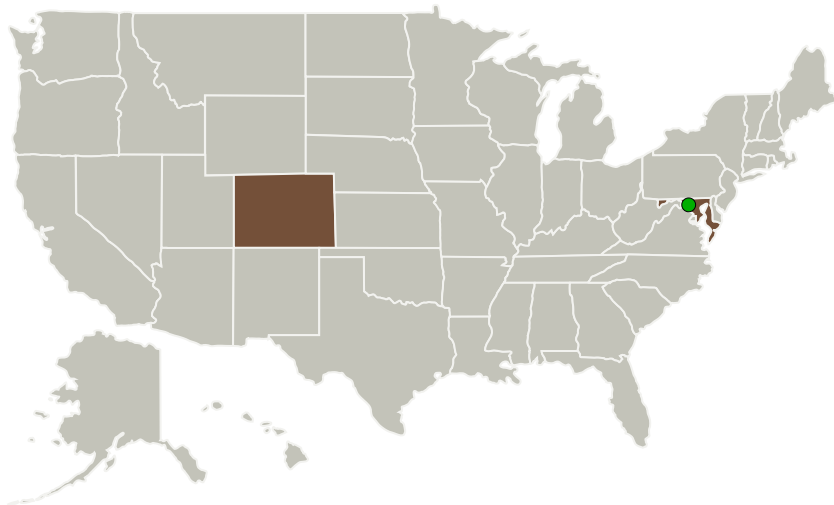
Completed Technology Project (2010 - 2010)



Project Introduction

Vescent Photonics propose to design and build revolutionary non-mechanical, electro-optic (EO) laser scanners that will be suitable for space based laser ranging, with a specific focus on the upcoming Lidar Surface Topography (LIST) mission. The success of past and current space based lidar missions (e.g., ICESat, CALIPSO, Lunar Reconnaissance Orbiter, MESSENGER) has demonstrated the utility of lidar. LIST, which will provide a high-resolution (5 meters horizontal and 10 centimeters vertical) topographic map of the Earth, will enable a vast array of important research including: detection of active faults, global shifts in vegetation patterns, coastal erosion, assessment of wildfire risk, and many more. To realize this (with the preferred scanned approach) new scanner technology is required. The scanner must provide 1000 resolvable spots at a rep rate of 10 kHz and must survive launch and maintain calibrated operation throughout the multiyear mission lifetime. Mechanical scanners are too slow and fragile, and current EO scanners provide insufficient resolution. The goal of this SBIR is to develop (from a current TRL 3 to 4 at end of phase I and 6 at end of phase II) and provide new EO scanners that will be suitable for LIST and other NASA lidar needs.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Vescent Photonics, Inc.	Lead Organization	Industry	Arvada, Colorado
● Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations	
Colorado	Maryland

Project Transitions

**January 2010:** Project Start**July 2010:** Closed out**Closeout Documentation:**

- Final Summary Chart(<https://techport.nasa.gov/file/139985>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Vescent Photonics, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Scott R Davis

Co-Investigator:

Scott Davis

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Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.1 Remote Sensing Instruments/Sensors
 - └ TX08.1.3 Optical Components

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System